CTC Combi PAL Control Driver User Guide

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Introduction

This document describes the configuration of the Combi PAL driver. It also explains how to build a control method for this driver, how to start and view a running acquisition and what actions are available during an analysis.

Installation and Configuration

Installing the Driver Software

To install the CompassCDS Drivers software, refer to the CompassCDS installation Guide.

Configuring the Driver

The driver software configuration is done in the CompassCDS Configuration Manager when a new chromatographic system is created.

Configuring the Combi PAL

Click on the button corresponding to the Combi PAL driver and the configuration screen appears.

The toolbar allows you to easily scroll through the configuration windows:

to select the first configuration window.

to select the previous configuration window.

to select the next configuration window.

Configuration Window

Computer Hardware Parameter Group:

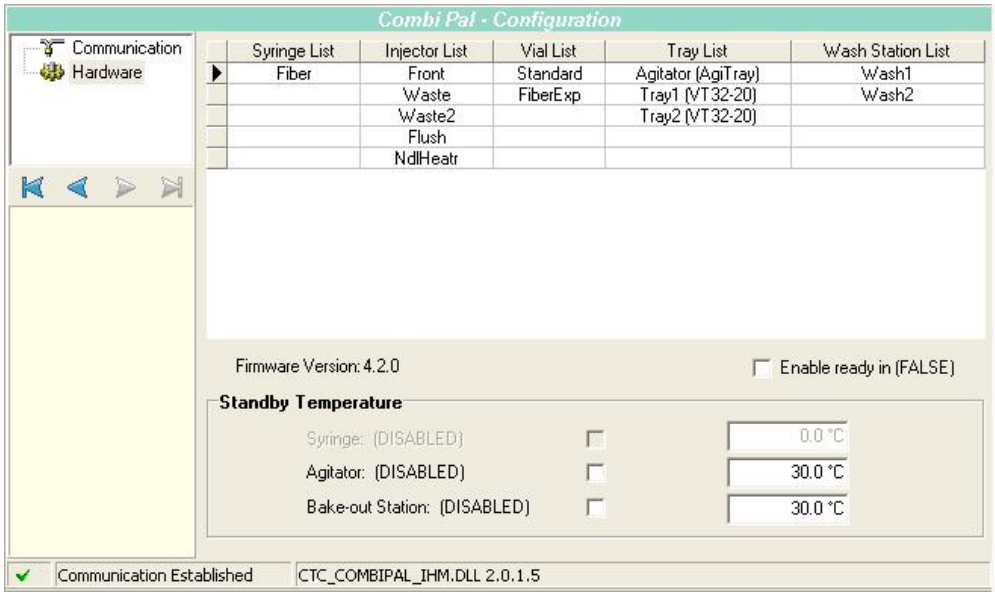
Select the Local Serial Port or the STAR 800 & 850 MIB Serial Port connected to the Combi PAL.

Communication Setup Parameter Group:

Select the corresponding Port Number of the computer.

Once the communication settings have been configured properly, close and reopen the Configure window in order to receive the Combi PAL configuration. The following screen is displayed when downloading the configuration of the Combi PAL.

Hardware Window



Syringe List: Displays the type of syringe installed on the autosampler. More information about the syringe list is displayed in the information field in yellow if the user clicks on the cell.

Injector List: Displays the list of injectors configured on the autosampler. More information about the injector list is displayed in the information field in yellow if the user clicks on the cell.

Vial List: Displays the list of vials configured on the autosampler. More information about the vial list is displayed in the information field in yellow if the user clicks on the cell.

Tray List: Displays the list of trays configured on the autosampler. More information about the tray list is displayed in the information field in yellow if the user clicks on the cell.

Wash Station List: Displays the list of wash stations configured on the autosampler. More information about the wash station list is displayed in the information field in yellow if the user clicks on the cell.

Check or uncheck the Enable ready in to activate or deactivate this option. If it is checked, the Combi PAL waits for a hardware “ready” input signal before starting. A Sync Signal called exactly "READY" must be created in the Combi PAL configuration.

Standby Temperature Parameter Group:

Depending of the Combi PAL configuration, the following standby temperature parameters may be available.

Check or uncheck the Syringe box to activate or deactivate this option. If this option is checked then the standby temperature of the syringe can be entered in the corresponding field.

Check or uncheck the Agitator box to activate or deactivate this option. If this option is checked then the standby temperature of the agitator can be entered in the corresponding field.

Check or uncheck the Bakeout Station box to activate or deactivate this option. If this option is checked then the standby temperature of the Bakeout Station can be entered in the corresponding field.

NOTE: If you want to modify the Combi PAL configuration, you need to setup the Combi PAL directly on the instrument. Refer to the instrument manual for more details.

Configuring the Synopsis

In the Overview part of the system configuration, a synopsis can be defined for the system. This synopsis depends on the configured devices.

1. To save the configuration of these devices, click on the OK button.

2. Right click on the system name in the bottom part of the CompassCDS Configuration Manager screen. A pop-up menu appears: click on Stop. Then right click on the system name again, and click on Start.

3. Go back to the System Configuration screen (Properties wizard). A graphic of the devices that comprise the system is displayed in the synopsis screen. To configure the synopsis as the real instrument configuration, move each module, then connect it appropriately. To do this, select one anchor for each of the two modules (the selected anchors become red) and click on the button; a connection tube will appear between the two anchors.

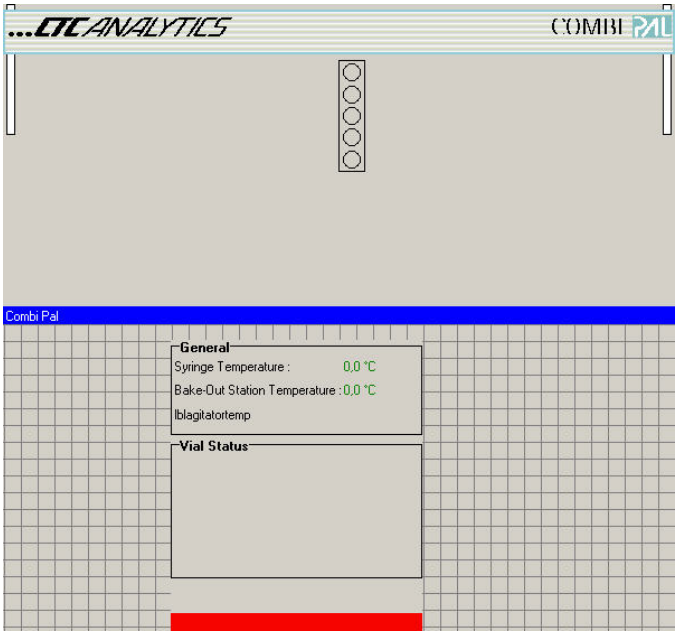
   Click on the to delete a selected tube, click on the buttons to delete all the tubes.

   Click on to define a background color, or on to make the background transparent.

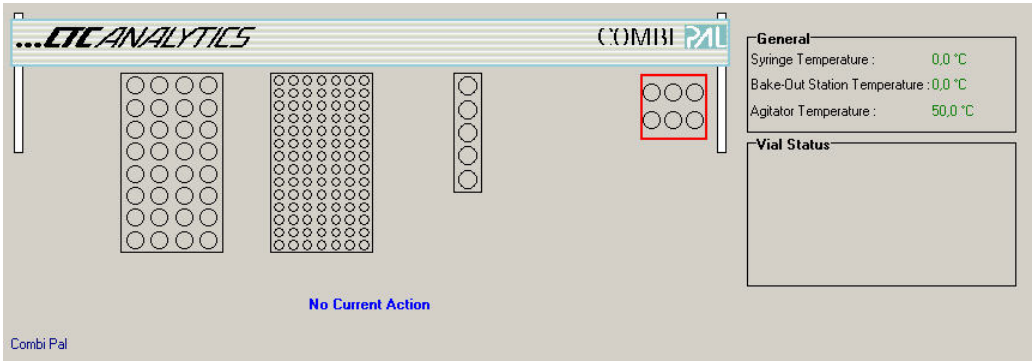
   Click on the icon to change the grid color.

4. Once the synopsis configuration is complete, it will be displayed in CompassCDS, in the Systems tab. In this tab, the Overview part will show the synopsis of the system with some parameters displayed (temperature, flow, signal, etc.) depending on the installed devices.

For example, the following pictures represent the synopsis of the Combi PAL:



CompassCDS Configuration Manager Screen



CompassCDS Screen

NOTE: Once the system has been created and correctly configured, it must be associated with one or more projects to start some acquisitions. For more details about the creation and configuration of a system, refer to the CompassCDS Configuration Manager User Guide.

Click on the button to print the current configuration.

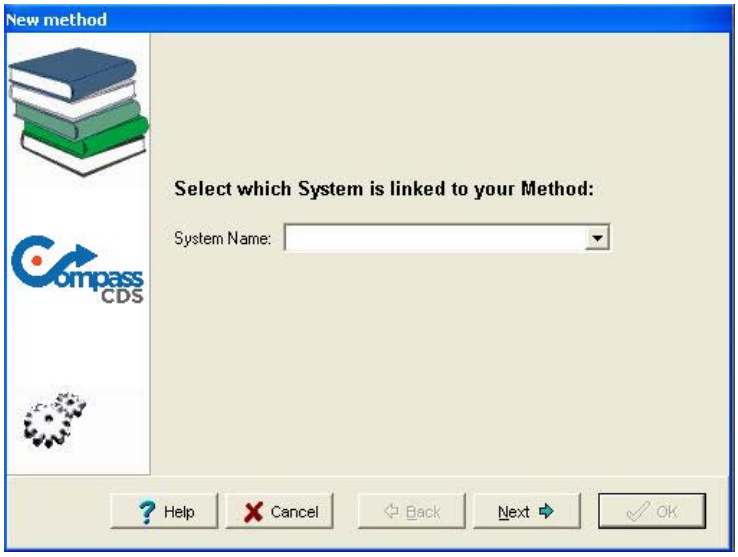
Building a Method

Creating a New Method

The method contains parameters for instrument control, data acquisition, chromatogram processing, and editing of final results. To initially set up a method, it is not necessary to define all of the sub-method sections; however, you must fill in the instrument control section prior to starting an acquisition.

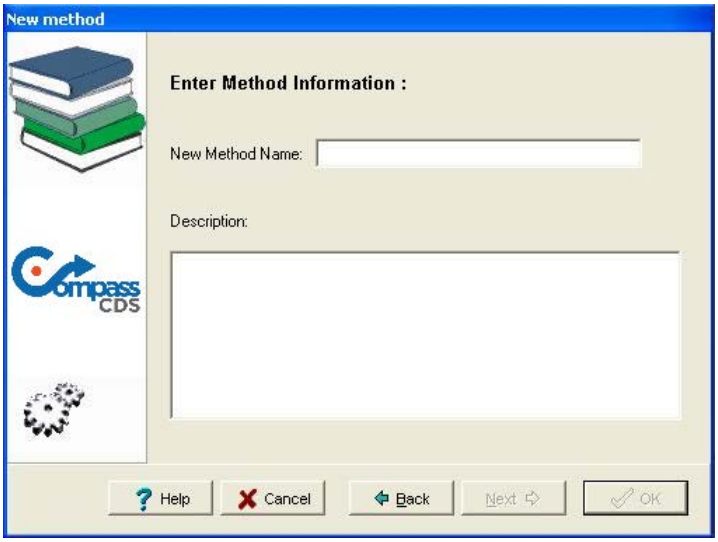
1. To create a new method, select the FILE / NEW METHOD option from CompassCDS main menu.

   A wizard guide will appear and provide assistance during the first steps of method creation:



2. Choose the system (chromatograph) associated with the method. A method is created for a particular system. When starting an acquisition, the name of the system that performs the acquisition must be correct, since method access is limited only to those methods associated with this system.

3. Once this field is completed, click on the Next button to move to the second step of the method creation:



4. Enter the New Method Name in the first field. In the Description field, enter information concerning the method (optional).

5. Once these two fields have been completed, click on the OK button. The new method is created and is opened with default parameters in CompassCDS. The next step is the definition of each of the method sections.

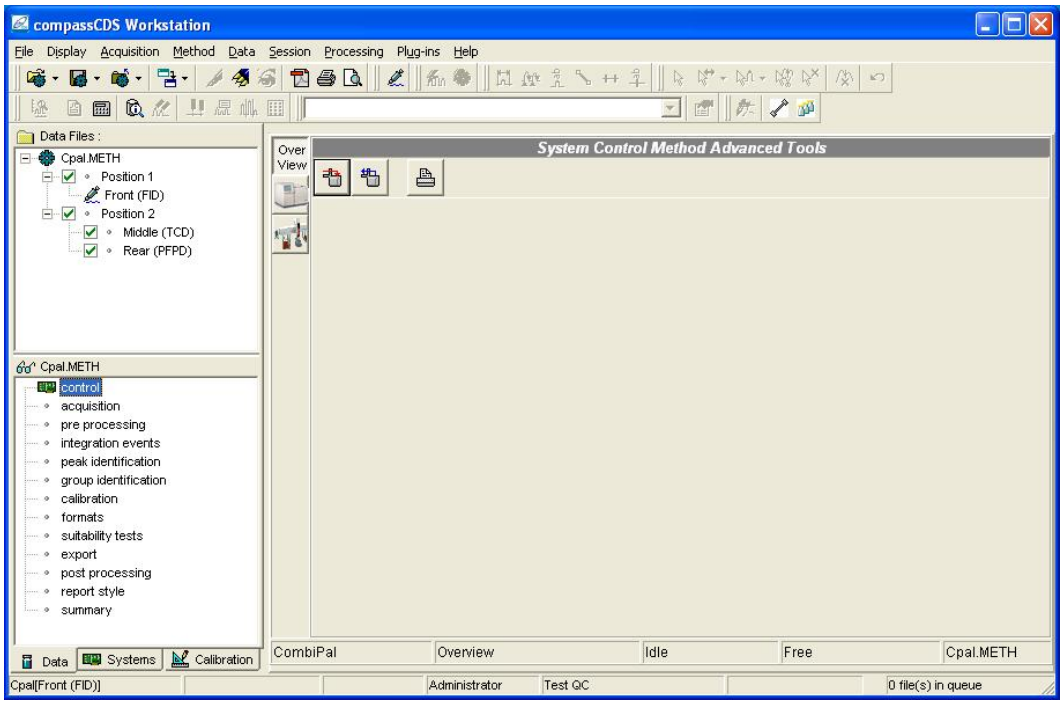
The instrument control section must be defined in order to start an acquisition. In the following part of this guide, only the instrument control section for the Combi PAL is detailed. Other parameters such as Injection Volume, Vial and Rack number may be necessary and are defined in the acquisition section.

NOTE: For more details about the programming of each method section, turn to CompassCDS User Guide.

Combi PAL Control Method

Once the new method is created, select the control section in the lower part of the browser.

The following screen appears:



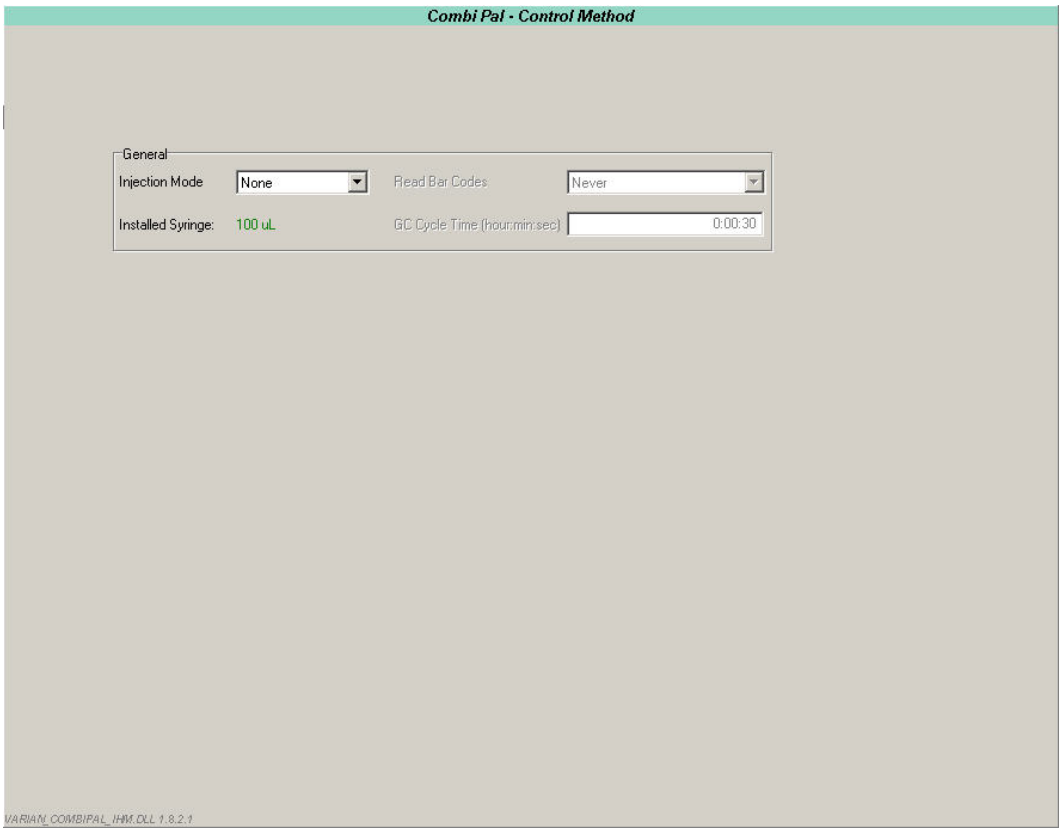
Press the Over View button to display the System Control Method Advanced Tools window:

to send the current method to the instrument.

to get the active method from the instrument.

to print the current method.

Click on the button to display the Combi PAL control method section.



General Parameters Group:

Select the Injection Mode parameters in the scrolling list to specify the injection type made by the autosampler. Four choices are available: None, Liquid, Headspace and SPME. If None is selected the Combi PAL will not perform any injection.

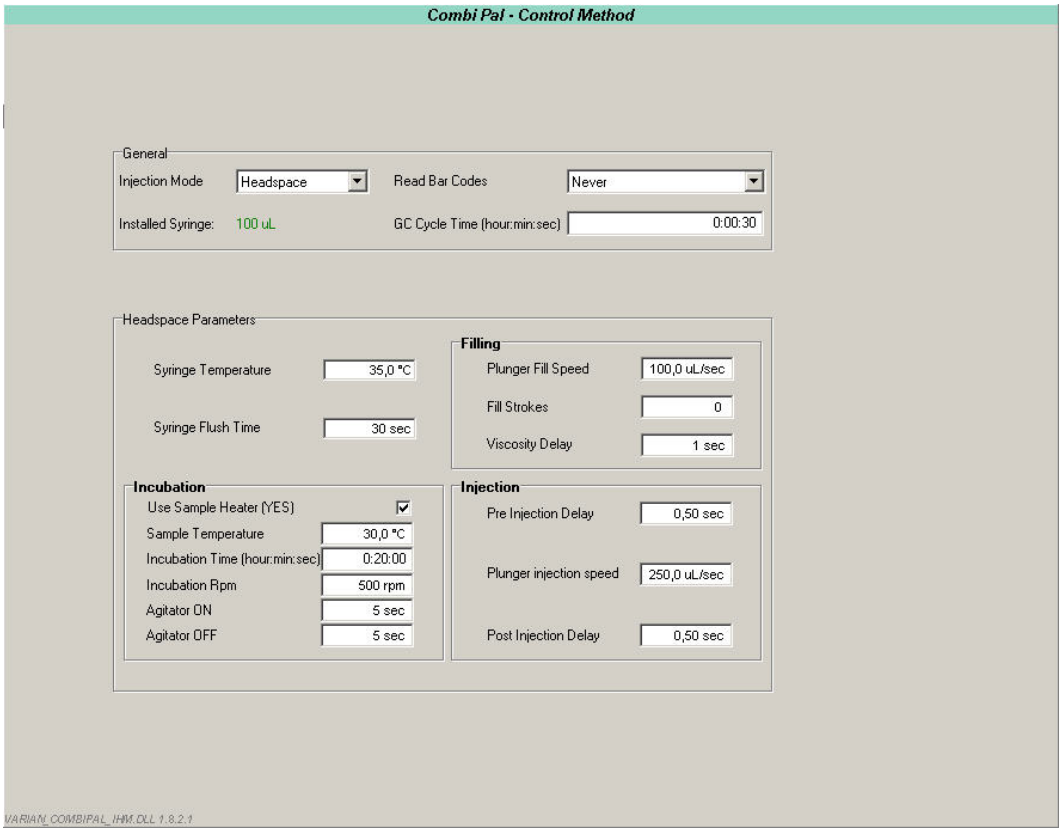
Installed Syringe: It displays the syringe installed on the instrument when the method was created. If the syringe installed on the instrument is different than the one in the method, no run can be performed with that method.

The GC Cycle Time parameter is the total time of an analysis. This parameter is required only if prep-ahead is used.

Select the Read Bar Codes parameters in the scrolling list to specify if and how the Autosampler should use the barcode reader. Three choices are available:

- Never
- For first injection of sample
- For each injection of sample.

Headspace Mode



Syringe Temperature: Specifies the temperature of the syringe if it is heated.

Syringe Flush Time: Specifies the amount of time the syringe will be flushed with gas after the injections.

Incubation Parameters Group:

Check or uncheck the Use Sample Heater box to activate or deactivate the use of the heated agitator.

Sample Temperature: Specifies the temperature of the heated agitator during incubation.

Incubation Time: Specifies the amount of time to heat/agitate the sample before the injection.

Incubation RPM: Specifies the rotation speed for the agitator during incubation.

Agitator On: Specifies the number of seconds the agitator is 'on' during the agitation cycle.

Agitator Off: Specifies the number of seconds the agitator is 'off' during the agitation cycle.

Filling Parameters Group:

Plunger Fill Speed: Sets the speed at which the sample will be drawn up into the syringe.

Fill Strokes: Sets the number of times the sample will be pumped in and out of the syringe before loading the sample volume into the syringe.

Viscosity Delay: Specifies the amount of time to wait after drawing up the sample in the syringe to account for the sample's viscosity.

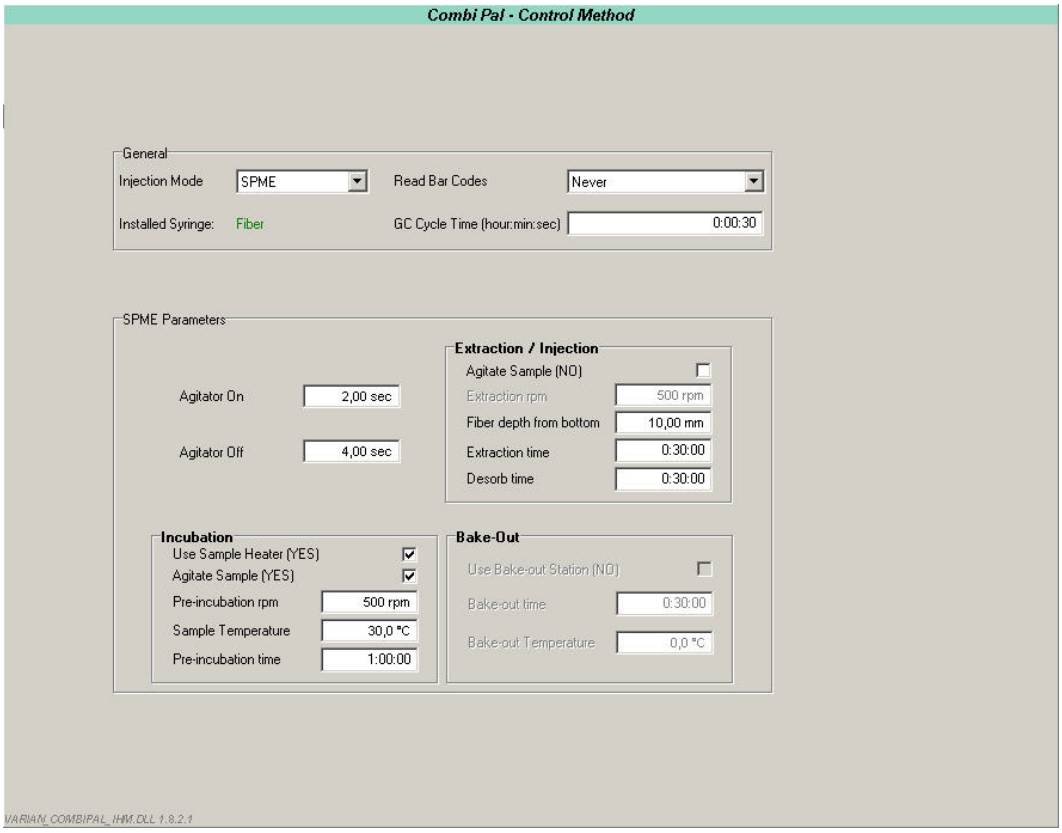
Injection Parameters Group:

Pre Injection Delay: Specifies the amount of time to wait with the needle in the injector before pushing down the plunger.

Plunger Injection Speed: Sets the injection speed.

Post Injection Delay: Specifies the amount of time to keep the syringe in the injector after the injection of sample.

SPME Mode



Agitator On: Specifies the number of seconds the agitator is 'on' during the agitation cycle.

Agitator Off: Specifies the number of seconds the agitator is 'off' during the agitation cycle.

Incubation Parameters Group:

Check or uncheck the Use Sample Heater box to activate or deactivate the use of the heated agitator.

Sample Temperature: Specifies the temperature of the heated agitator during incubation.

Pre-incubation Time: Specifies the amount of time to heat/agitate the sample before the SPME extraction.

Pre-incubation RPM: Specifies the rotation speed for the agitator.

Extraction / Injection Parameters Group:

Fiber depth from bottom: Specifies the height of the fiber's tip above the bottom of the vial.

Extraction RPM: Specifies the rotation speed for the agitator.

Extraction time: Specifies the time the fiber will stay in the sample.

Desorb time: Specifies the time the fiber will be exposed in the injector to desorb the sample.

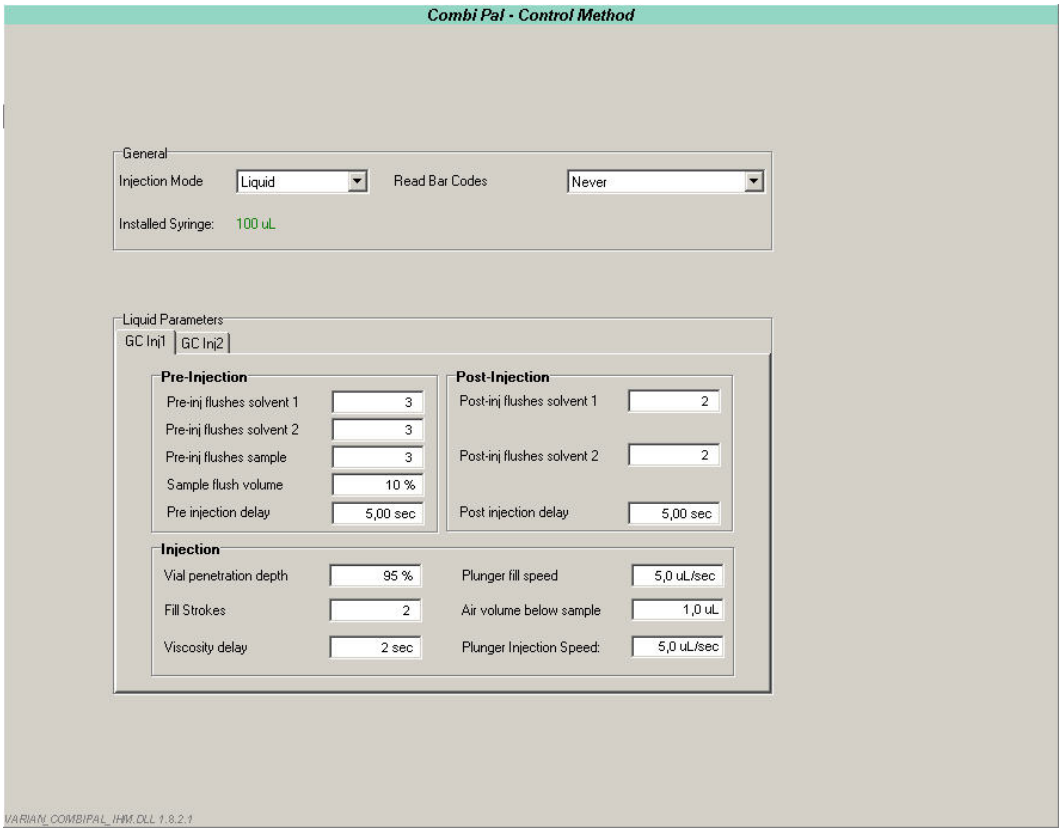
Bake-Out Parameters Group:

Check or uncheck the Use Bake-Out Station box to use or or not the fiber conditioning station to clean the fiber after injection (Yes/No).

Bake-Out temperature: Sets the temperature of the bake-out station where the fiber will be conditioned.

Bake-Out Time: Sets the amount of time to condition the fiber.

Liquid Mode



If multiple injectors are present in the Combi PAL configuration, multiple tabs will appear in the liquid parameters (one tab per injector). Select the tab and define the appropriate injection parameter for each injector.

Pre Injection Parameters Group:

Pre-Inj Flushes Solvent 1: Sets the number of times solvent 1 will be drawn up into the syringe and expelled into the waste vial before flushing with solvent 2.

Pre-Inj Flushes Solvent 2: Sets the number of times solvent 2 will be drawn up into the syringe and expelled into the waste vial before flushing with the sample.

Pre-Inj Flushes Sample: Sets the number of times the sample will be drawn up into the syringe and expelled into the waste vial before injection.

Sample Flush Volume: Specifies the percentage of syringe to be used in sample flushes.

Pre Injection Delay: Specifies the amount of time to wait with the needle in the injector before pushing down the plunger.

Injection Parameters Group:

Vial Penetration Depth: Sets how far the syringe needle goes down into the sample vial. 100% corresponds to the bottom of the vial.

Fill Strokes: Sets the number of times the sample will be pumped in and out of the syringe before loading the sample volume into the syringe.

Viscosity Delay: Specifies the amount of time to wait after drawing up the sample in the syringe to account for the sample's viscosity.

Plunger Fill Speed: Sets the speed at which the sample will be drawn up into the syringe.

Air Volume Below Sample: Specifies the volume of the air gap to draw in after drawing the sample.

Plunger Injection Speed: Sets the injection speed.

Post Injection Parameters Group:

Post Injection Flush 1: Sets the number of times solvent 1 will be drawn up into the syringe and expelled into the waste vial before flushing with solvent 2.

Post Injection FIush 2: Sets the number of times solvent 2 will be drawn up into the syringe and expelled into the waste vial.

Post Injection Delay: Specifies the amount of time to keep the syringe in the injector after the injection of sample.

Starting and Viewing an Acquisition

Quick Start and Sequence

Once the instrument control method has been correctly programmed, an analysis can be started. The next section briefly describes how to start an acquisition.

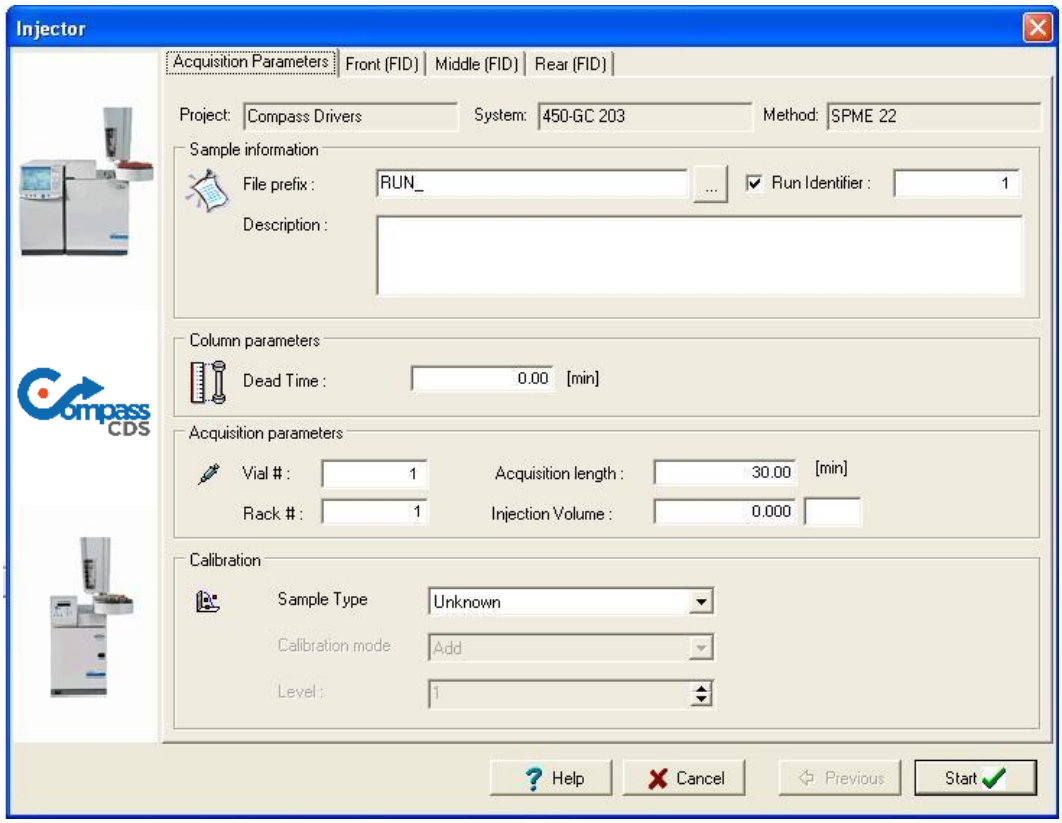
Quick Start (Single Acquisition)

1. Press the button.

   In the Quick Start window, select the system, the method and optionally the project if connected in "All project" mode.

2. Press the OK button.

The following screen is displayed:



In the Acquisition Parameters tab, required fields like the Run Name, the Run ID and the Acquisition length must be filled in before starting an analysis. Furthermore, if the system is equipped with an autosampler controlled by CompassCDS, the Injection Volume, the Vial position and the Rack number (if required) must be entered.

Other parameters associated with each acquisition channel can be entered in the Channel X tab.

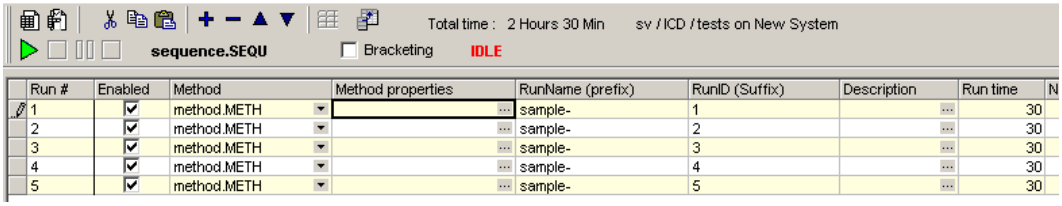
3. Click on the Start button to start the acquisition if the system is a single-injector system or click on the Next button if the system is a multiple injector system. In a multiple

injector system, the same parameters entered for the first injector must be entered for the other injectors before starting the acquisition.

Sequence

1. To create a sequence, select the FILE / NEW SEQUENCE menu, and complete the displayed creation wizard screen (refer to CompassCDS User Guide), by entering the system name that will perform the analysis, the number of lines (corresponding to the number of samples), and the sequence name.

2. The sequence is displayed. Complete the sequence information columns (refer to CompassCDS User Guide).



Run #	Enabled	Method	Method properties	RunName (prefix)	RunID (Suffix)	Description	Run time	N
1	☑	method.METH		sample-	1		30	
2	☑	method.METH		sample-	2		30	
3	☑	method.METH		sample-	3		30	
4	☑	method.METH		sample-	4		30	
5	☑	method.METH		sample-	5		30	

The Method Name, the Run Name, the Run ID, and the Acquisition length must be filled in before starting the analysis. All these parameters are automatically imported from the acquisition part if defined in the method.

3. Start the sequence by clicking on the button.

NOTE: For more details about how to start an acquisition, refer to CompassCDS User Guide.

Running Acquisition Status

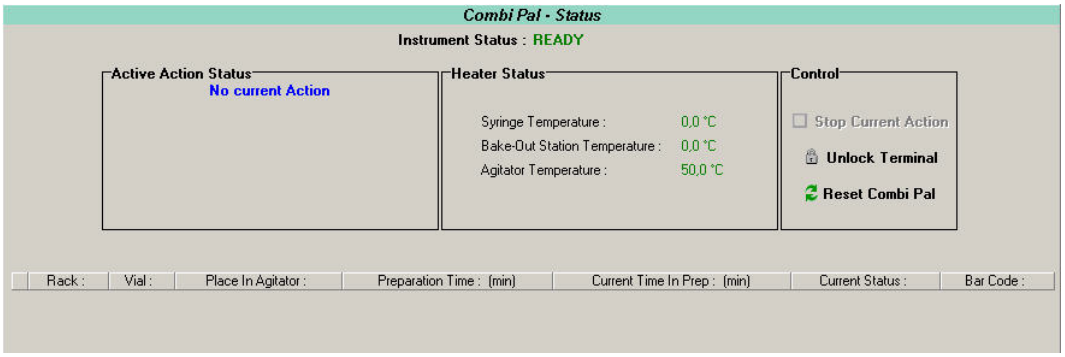
Viewing a Running Acquisition

To view a running acquisition, click on the Systems tab then select the running system. A window is activated which is composed of two parts: the running chromatogram and the status window where the driver modules are listed.

Status of the Combi PAL

Click on the button corresponding to the Combi PAL driver and the Combi PAL status screen will appear.

Status Window



Instrument Status: This displays the state of the instrument ready or not ready

Active ActionStatus: This displays the action currently done by the Combi PAL

Heater Status Parameter Group:

Syringe Temperature: This parameter displays the current temperature of the syringe if it is a heated syringe.

BakeOut Station Temperature: This parameter displays the current temperature of the bake out station.

Agitator Temperature: This parameter displays the current temperature of the agitator.

Control Buttons

This button stops the current action of the Combi PAL.

This button unlocks the Combi PAL terminal.

This button resets the Combi PAL.

The table in the status displays what vials are used by the Combi PAL and their state.

Rack: This parameter indicates the rack of the vial

Vial: This parameter indicates the position of the vial

Place in agitator: This parameter indicates the position the vial in the agitator.

Preparation Time: This parameter shows how long the vial will be prepared and the current preparation time.

Actual time in prep: This parameter gives the current preparation time.

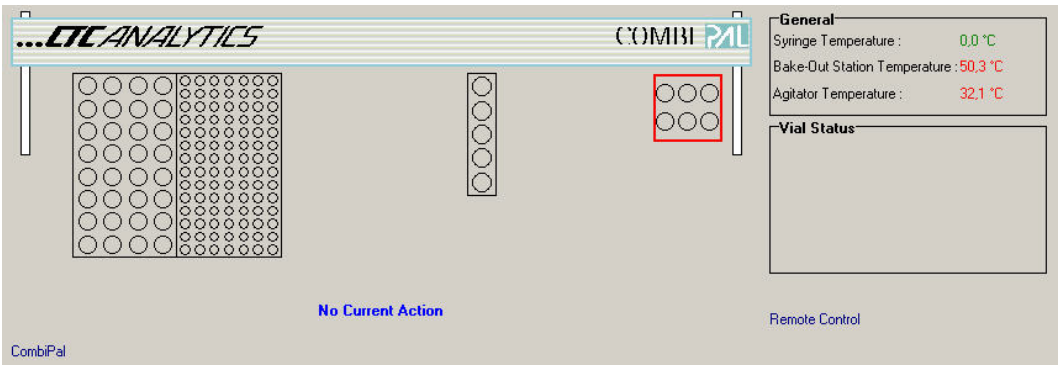
Actual Status: This parameter gives the status of the vial. It can be transport, preparation, ready, injecting and injected.

Bar code: This parameter displays if the bar code of the vial.

Overview Window

Click on the Over View button: the Status Overview window is displayed and contains three tabs:

General: displays the synopsis of the instrument, where some current values can be read (temperatures and pressures).



Not Ready: contains the not ready information sent by the instrument.

Events: contains the events that have occurred on the instrument.